

JOB COMPLETION REPORT
INVESTIGATIONS PROJECTS

State of Montana

Project No. F-8-R-2

Work Plan No. III

Job No. III-A

Title of Job: Diagnosis of Montana Hatchery and Wild Trout Disease.

Objectives:

The project leader will endeavor to diagnose occurrences of diseases as they are reported in Montana during the period covered by this project. In the case of diseases caused by organisms such as bacteria, protozoa, etc. the causative organisms are to be identified. Contributing factors such as faulty diets and unfavorable environmental conditions will be recorded in each case.

Techniques Used:

Several trips were made to various hatcheries in response to reports of sick and dying fish. An attempt was made in each case to determine the cause of the trouble. The behavior and general appearance of the fish, the conditions of the environment, microscopical examinations of fresh and stained slide preparations, and in some cases bacterial cultures were used in making the diagnoses.

Findings:

Arlee Hatchery:

Species involved - Rainbow and cutthroat trout most seriously effected during the first 14 weeks of life.

Symptoms - Loss of appetite, sluggishness, swollen gills congested with mucous, gill filaments sometimes become fused.

Disease - Bacterial gill disease; myxobacteria present in large numbers on the surface of gills.

Diet - Beef or horse liver and hearts.

Method of food presentation - Ricer.

Temperature - 47 to 51° F.

Extent of Mortalities - Losses to gill disease may exceed 90 percent.

Arlee Hatchery:

Species involved - Cutthroat trout 1 to 10 months old.

Symptoms - Posterior one third of the fish turns very dark. Disintegration of the tail begins at the extremity of the soft rays of the caudal fin and progresses anteriorly. Many of the fish live until the entire tail has disappeared.

Disease - Unknown.

Diet - Beef or horse liver and hearts.

Method of food presentation - Ricer.

Temperature - 47 to 51° F.

Extent of mortalities - Insignificant during the summer months but increasing somewhat during the fall and winter.

Arlee Hatchery:

Species involved - Brown trout 3 to 4 months old.

Symptoms - Anal region swollen and inflamed.

Disease - Intestinal inflammation; fungus, probably Saprolegnia imperfecti was found growing in the inflamed tissues of the anal region.

Diet - Beef or horse liver and hearts.

Method of food presentation - Ricer.

Temperature - 49° F.

Extent of mortalities - The symptoms lasted for about four weeks during which time losses rose from approximately 30 a day to 684 on the 11th day and then gradually dropped to about 35 a day.

Emigrant Hatchery:

Species involved - Rainbow and cutthroat trout yearlings.

Symptoms - Popeye, the body cavity greatly distended from an accumulation of colorless water fluid, the kidney tubules contain numerous casts and crystals believed to be calcium carbonate. Rainbow trout turn dark before they die. The cutthroat trout so far have not developed this excessive show of pigment. Livers of the fish were not normal in color; colors of livers varied from greyish red to yellow.

Disease - Popeye. H. S. Davis (1946) in his "Care and Disease of Trout" suggests that the disease may be connected in some way with calcium metabolism and that it occurs only at hard water stations. Two percent cod liver oil in the diet is said to reduce losses at some hatcheries.

Diet - Horse hearts.

Method of presentation - Spoon.

Temperature - 47° F.

Extent of mortalities - One hundred percent of the yearling rainbows during the summer of 1952. Loss of cutthroat trout so far has been negligible. Brown trout at this station also had some of the crystals in their kidneys but appear to be less affected and did not develop popeye.

Hamilton Hatchery:

Species involved - Cutthroat trout being held in new cement tanks inside the hatchery

Symptoms - Emaciated, no fat or in some cases, a very oily type of fat deposited in the fat depot beside the intestine.

It is of interest to note that the same stock of cutthroat trout have done quite well in a dirt-bottomed pond just outside the hatchery.

Disease - Unknown.

Extent of Mortalities - Estimated at 80 percent of total population.

Libby Hatchery:

Species involved - Rainbow and eastern brook trout in cement raceways.

Symptoms - Emaciated, flashing.

Disease - External parasites, Trichodina and Gyrodactylus.

It is unusual for these parasites to constitute a serious problem to trout in cement raceways but favorable conditions for these parasites prevail when water flow is cut down to allow for maximum warming of the water.

Somers Hatchery:

Species involved - Cutthroat trout approximately two months old.

Symptoms - Loss of appetite, sluggish, somewhat emaciated, gills covered with mucous which was heavily infected with myxobacteria.

Disease - Bacterial gill disease.

Extent of Mortalities - Mortality rate was considerable higher than usual for this station. PMA treatments reduced the mortality rate to normal and the fish began feeding again.

Analysis and Recommendations:

The "trouble shooter" type of work required by this job has been valuable in that it has increased the project leader's familiarity with various trout diseases through first hand contact. The hatcheries involved can also profit whenever the disease is diagnosed correctly and prevention or cure is possible. It is therefore recommended that this job be continued.

Summary:

Several trips were made in 1952 to various state hatcheries to investigate reported cases of sick trout. Among the diseases encountered were: bacterial gill disease, intestinal inflammation, popeye in which the kidney contained numerous mineral crystals, and external parasites (Trichodina and Gyrodactylus). At some hatcheries the true nature of the trouble was not apparent to the project leader and further effort will be made to solve these problems as time permits.

Data and Reports:

Original data and reports are in the custody of the project leader at Missoula, Montana.

Prepared by Jack E. Bailey Approved by _____

Date March, 1953